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SEMICONDUCTOR DEVICE

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[There are no amendments to this patent.]

### Abstract

#### Objective

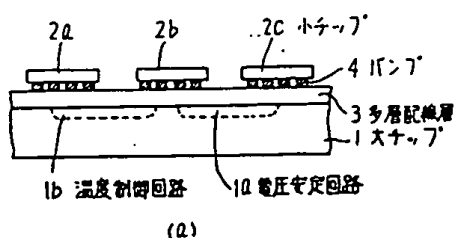
[The present invention] concerns a semiconductor device, and the objective is to offer a semiconductor device that includes multiple chips, has a high mounting density, and is equipped with a voltage stabilizing circuit, which supplies a current to the multiple chips, and a temperature controlling circuit, which controls the temperature of the multiple chips.

#### Constitution

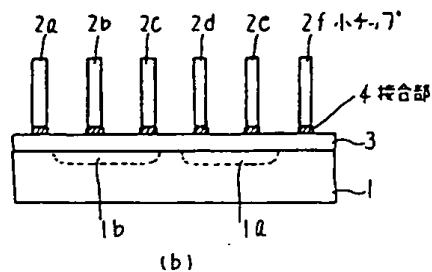
It consists of a semiconductor device, which has a large chip (1), in which active circuits (1a) and (1b) are formed, a multilayered wiring layer (3), which is formed over the large chip (1), and multiple small chips (2a)-(2f), which are bonded to the multilayered wiring layer (3), and in which the multilayered wiring layer (3) has a wiring layer which is connected to the active circuits (1a) and (1b) and a wiring layer which is

connected to the multiple small chips (2a)-(2f). Also, it consists of a semiconductor device in which the active elements include a voltage stabilizing circuit (1a) which supplies electrical power to the multiple small chips (2a)-(2f). Also, it consists of a semiconductor device in which the active circuits include a temperature controlling circuit (1b) which controls the temperature of the multiple small chips (2a)-(2f).

Cross-sectional diagram which shows the semiconductor device of this invention



- Key: 1      Large chip  
       1a     Voltage stabilizing circuit  
       1b     Temperature controlling circuit  
       2c     Small chip  
       3      Multilayered wiring layer  
       4      Bump



Key: 2f    Small chip  
 4        Bonded section

### Claims

1. A semiconductor device characterized by having  
 a large chip (1) in which active circuits (1a, 1b) are  
 formed,  
 a multilayered wiring layer (3), which is formed over said  
 large chip (1), and multiple small chips (2a)-(2f) which are  
 bonded to said multilayered wiring layer (3),  
 and in which said multilayered wiring layer (3) has a wiring  
 layer which is connected to said active circuits (1a, 1b), and a  
 wiring layer which is connected to said multiple small chips  
 (2a)-(2f).
2. The semiconductor device described in Claim 1,  
 characterized by the aforementioned active circuits including a  
 voltage stabilizing circuit (1a) which supplies electrical power  
 to said multiple small chips (2a)-(2f).

3. The semiconductor device described in Claim 1, characterized by the aforementioned active circuits including a temperature controlling circuit (1b) which controls the temperature of said multiple small chips (2a)-(2f).

4. The semiconductor device described in Claim 1, characterized by an insulating film (16) between the wiring layer which is connected to the aforementioned active circuits (1a,1b), and the wiring layer, which is connected to the aforementioned multiple small chips (2a)-(2f), being a silicon oxide film with a thickness of more than 10  $\mu\text{m}$  and less than 20  $\mu\text{m}$ .

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